

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

261 Understanding AIDS: An Information Brochure Being Mailed To All U.S. Households
270 Human Ehrlichiosis — United States
277 Recommendations for the Prevention of Malaria in Travelers

Perspectives in Disease Prevention and Health Promotion

Understanding AIDS: An Information Brochure Being Mailed To All U.S. Households

Approximately 107 million English-language versions of a brochure, "Understanding AIDS," will be distributed to every home and residential post office box by the U.S. Postal Service between May 26 and June 30, 1988. A Spanish-language version will be distributed in Puerto Rico and will also be available upon request after May 26, 1988. This national mailing marks the first time the federal government has attempted to contact virtually every resident, directly by mail, regarding a major public health problem. The brochure is reproduced in its entirety beginning on page 262.

The brochure was prepared by CDC in consultation with the Surgeon General and a wide spectrum of public health officials, medical experts, advertising consultants, and members of the general public. Every effort was made to make the presentation simple, direct, and understandable to the widest possible audience. The purpose of the mailer is to provide understandable information and to encourage safe behaviors that can prevent HIV infection. The mailing has three objectives:

- To make it clear how AIDS is and is not transmitted. People can protect themselves without having unnecessary fears.
- To make it clear that behaviors, not identification with "risk groups," put people at risk. As the brochure states, "who you are has nothing to do with whether you are in danger of being infected with the AIDS virus. What matters is what you do."
- To stimulate informed discussions about AIDS within families, between sexual partners, and at all levels of society by presenting the facts and showing people how AIDS relates to their own lives.

CDC has established a major effort to ensure that as many people as possible read and discuss this mailing. Major steps, including contacts with state health departments and manufacturers of AIDS testing kits, have been taken to handle the increased requests for information and testing that this brochure may generate. CDC will add up to 1,000 operators to the National AIDS Information Line (hotline) (1-800-342-AIDS) to handle the 1.5 million new calls anticipated during the mailing period. At present, the hotline is handling 120,000 calls per month as a result of the "America Responds to AIDS" public information campaign.

AIDS — Continued

Hotline callers wishing to talk with a counselor or requesting information about local counseling and testing will be referred to local hotline numbers or, if none exist, will be served by counselors who staff the National AIDS Information Line. More than 300 Spanish-speaking operators will be available to answer a toll-free hotline (1-800-344-SIDA) to take orders for Spanish-language copies of the brochure. Requests for copies of the brochure in English or Spanish will be filled by the CDC National AIDS Clearinghouse.

To measure the impact of this brochure, CDC will use data gathered through the AIDS Knowledge and Attitudes supplement of the National Health Interview Survey (NHIS). This survey is conducted through interviews with a probability sample of American households by the Bureau of the Census for the National Center for Health Statistics. CDC will also monitor other indicators that may reflect public response to the brochure, such as calls to the national hotline and AIDS clearinghouse, requests for information to health-care providers, and media presentations of AIDS information.

In spite of all these efforts, there are things the brochure will not do. It will not reach people who cannot read or who read only languages other than English or Spanish. It may not reach the homeless or drug abusers, who need intensive outreach efforts. CDC is working with state and local health departments to target ongoing educational efforts for the hard-to-reach. One million advance copies of the brochure are being sent to doctors, nurses, dentists, pharmacists, hospitals, and public health officials so that they can be prepared to answer questions from their patients and clients.

Understanding AIDS

A Message From The Surgeon General

This brochure has been sent to you by the Government of the United States. In preparing it, we have consulted with the top health experts in the country.

I feel it is important that you have the best information now available for fighting the AIDS virus, a health problem that the President has called "Public Enemy Number One."

Stopping AIDS is up to you, your family and your loved ones.

Some of the issues involved in this brochure may not be things you are used to discussing openly. I can easily understand that. But now you must discuss them. We all must know about AIDS. Read this brochure and talk about it with those you love. Get involved. Many schools, churches, synagogues, and community groups offer AIDS education activities.

I encourage you to practice responsible behavior based on understanding and strong personal values. This is what you can do to stop AIDS.



C. Everett Koop, M.D., Sc.D.
Surgeon General

A handwritten signature in cursive script, which appears to be "C. Everett Koop".

What AIDS Means To You

AIDS is one of the most serious health problems that has ever faced the American public. It is important that we all, regardless of who we are, understand this disease.

AIDS stands for *acquired immunodeficiency syndrome*. It is a disease caused by the Human Immunodeficiency Virus, HIV—the AIDS virus.

The AIDS virus may live in the human body for years before actual symptoms appear. It primarily affects you by making you unable to fight other diseases. These other diseases can kill you.

Many people feel that only certain "high risk groups" of people are infected by the AIDS

virus. This is untrue. *Who you are has nothing to do with whether you are in danger of being infected with the AIDS virus. What matters is what you do.*

People are worried about getting AIDS. Some should be worried and need to take some serious precautions. But many are not in danger of contracting AIDS.

The purpose of this brochure is to tell you how you can, and just as important, how you can't become infected with the AIDS virus.

Your children need to know about AIDS. Discuss it with them as you would any health concern.

How Do You Get AIDS?

There are two main ways you can get AIDS. First, you can become infected by having sex—oral, anal or vaginal—with someone who is infected with the AIDS virus.

Second, you can be infected by sharing drug needles and syringes with an infected person.

Babies of women who have been infected with the AIDS virus may be born with the infection because it can be transmitted from the mother to the baby before or during birth.

In addition, some persons with hemophilia and others have been infected by receiving blood (see page 3).

Can You Become Infected?

Yes, if you engage in risky behavior.

The male homosexual population was the first in this country to feel the effects of the disease. But in spite of what you may have heard, the number of heterosexual cases is growing.

People who have died of AIDS in the U.S. have been male and female, rich and poor, white, Black, Hispanic, Asian and American Indian.

How Do You Get AIDS From Sex?

The AIDS virus can be spread by sexual intercourse whether you are male or female, heterosex-



"Obviously women can get AIDS. I'm here to witness to that. AIDS is not a 'we,' 'they' disease, it's an 'us' disease."

—Carole has AIDS

ual, bisexual or homosexual.

This happens because a person infected with the AIDS virus may have the virus in semen or vaginal fluids. The virus can enter the body through the vagina, penis, rectum or mouth.

Anal intercourse, with or without a condom, is risky. The rectum is easily injured during anal intercourse.

Remember, AIDS is sexually transmitted, and the AIDS virus is not the only infection that is passed through intimate sexual contact.

Other sexually transmitted diseases, such as gonorrhea, syphilis, herpes and chlamydia, can also be contracted through oral, anal and vaginal intercourse. If you are infected with one of these diseases and engage in risky behavior (see page 3), you are at greater risk of getting AIDS.

AIDS - Continued

You Won't Get AIDS From Insects—Or A Kiss

No matter what you may have heard, the AIDS virus is hard to get and is easily avoided.

You won't just "catch" AIDS like a cold or flu because the virus is a different type. The AIDS virus is transmitted through sexual intercourse, the sharing of drug needles, or to babies of infected mothers before or during birth.

You won't get the AIDS virus through everyday contact with the people around you in school, in the workplace, at parties, child care centers, or stores. You won't get it by swimming in a pool, even if someone in the pool is infected with the AIDS virus. Students attending school with someone infected with the AIDS virus are not in danger from casual contact.

You won't get AIDS from a mosquito bite. The AIDS virus is not transmitted through a mosquito's salivary glands like other diseases such as malaria or yellow fever. You won't get it from bed bugs, lice, flies or other insects, either.

You won't get AIDS from saliva, sweat, tears, urine or a bowel movement.

You won't get AIDS from a kiss.

You won't get AIDS from clothes, a telephone, or from a toilet seat. It can't be passed by using a glass or eating utensils that someone else has used. You won't get the virus by being on a bus, train or crowded elevator with a person who is infected with the virus, or who has AIDS.

The Difference Between Giving And Receiving Blood

1. Giving blood. You are not now, nor have you ever been in danger of getting AIDS from giving blood at a blood bank. The needles that are used for blood donations are brand-new. Once they are used, they are destroyed. There is no way you can come into contact with the AIDS virus by donating blood.

2. Receiving blood. The risk of getting AIDS from a blood transfusion has been greatly reduced. In the interest of making the blood supply as safe as possible, donors are screened for risk factors and donated blood is tested for the AIDS antibody. Call your local blood bank if you have questions.

What Behavior Puts You At Risk?

You are at risk of being infected with the AIDS virus if you have sex with someone who is infected, or if you share drug needles and syringes with someone who is infected.

Since you can't be sure who is infected, your chances of coming into contact with the virus increase with the number of sex partners you have. Any exchange of infected blood, semen or vaginal fluids can spread the virus and place you at great risk.

The following behaviors are risky when performed with an infected person. You can't tell by looking if a person is infected.

RISKY BEHAVIOR

Sharing drug needles and syringes.

Anal sex, with or without a condom.

Vaginal or oral sex with someone who shoots drugs or engages in anal sex.

Sex with someone you don't know well (a pickup or prostitute) or with someone you know has several sex partners.

Unprotected sex (without a condom) with an infected person.

SAFE BEHAVIOR

Not having sex.

Sex with one mutually faithful, uninfected partner.

Not shooting drugs.

What About Dating?

Dating and getting to know other people is a normal part of life. Dating doesn't mean the same thing as having sex. Sexual intercourse as a part of dating can be risky. One of the risks is AIDS.

How can you tell if someone you're dating or would like to date has been exposed to the AIDS virus? The bad news is, you can't. But the good news is, as long as sexual activity and sharing drug needles are avoided, it doesn't matter.

You are going to have to be careful about the person you become sexually involved with, making your own decision based on your own best judgment. That can be difficult.

Has this person had any sexually transmitted diseases? How many people have they been to bed with? Have they experimented with drugs? All these are



"Talk to your teenagers about AIDS. It is primarily a sexually transmitted disease. So if you're going to talk about AIDS, there's no way you can avoid talking about sex."

— Sally Juc
AIDS Counselor

sensitive, but important, questions. But you have a personal responsibility to ask.

Think of it this way. If you know someone well enough to have sex, then you should be able to talk about AIDS. If someone is unwilling to talk, you shouldn't have sex.

Do Married People Get AIDS?

Married people who are uninfected, faithful and don't shoot drugs are not at risk. But if they engage in risky behavior (see page 3), they can become infected with the AIDS virus and infect their partners. If you feel your spouse may be putting you at risk, talk to him or her. It's your life.

What Is All The Talk About Condoms?

Not so very long ago, condoms (rubbers or prophylactics) were things we didn't talk about very much.

Now, they're discussed on the evening news and on the front page of your newspaper, and displayed out in the open in your local drugstore, grocery, and convenience store.

For those who are sexually active and not limiting their sexual activity to one partner, condoms have been shown to help prevent the spread of sexually transmitted diseases. That is why the use of condoms is recommended to help reduce the spread of AIDS.

Condoms are the best preventive measure against AIDS besides not having sex and practicing safe behavior (see page 3).

But condoms are far from being foolproof. You have to use them properly. And you have to use them every time you have sex, from start to finish. If you use a condom, you should remember these guidelines:

(1) Use condoms made of latex rubber. Latex serves as a barrier to the virus. "Lambskin"

or "natural membrane" condoms are not as good because of the pores in the material. Look for the word "latex" on the package.

(2) A condom with a spermicide may provide additional protection. Spermicides have been shown in laboratory tests to kill the virus. Use the spermicide in the tip and outside the condom.

(3) Condom use is safer with a lubricant. Check the list of ingredients on the back of the lubricant package to make sure the lubricant is water-based. Do not use petroleum-based jelly, cold cream, baby oil or cooking shortening. These can weaken the condom and cause it to break.



"Condoms can be most effective when they are used correctly, and there is a right way and a wrong way to use one. Always use a latex condom."

— Drew Sisselman
AIDS Volunteer

AIDS - Continued

What Does Someone With AIDS Look Like?

It is very important that everyone understands that a person can be infected with the AIDS virus without showing any symptoms at all.

It is possible to be infected for years, feel fine, look fine and have no way of knowing you are infected unless you have a test for the AIDS virus.

During this period, however, people infected with the AIDS virus can pass the virus to sexual partners, to people with whom drug needles are shared, and to children before or during birth. That is one of the most disturbing things about AIDS.

Once symptoms do appear, they are similar to the symptoms of some other diseases. As the disease progresses, they become more serious. That is because the AIDS virus keeps your body's natural defenses from operating correctly.

If you are concerned whether you might be infected, consider your own behavior and its effects on others. If you feel you need to be tested for the AIDS virus, talk to a doctor or an AIDS counselor for more information. (*See below.*)



"You can't tell if someone has been infected by the AIDS virus by looking at him or her. But you aren't in danger of getting the disease unless you engage in risky behavior with someone who is infected."

— Anthony S. Fauci, M.D.
Director, National Institute of Allergy and Infectious Diseases and Coordinator of the National Institutes of Health AIDS Research

Is There A Cure For AIDS?

There is presently no cure for AIDS.

Medicines such as AZT have prolonged the lives of some people with AIDS. There is hope that additional treatments will be found.

There is also no vaccine to prevent uninfected people from getting the infection. Researchers believe it may take years for an effective, safe vaccine to be found.

The most effective way to prevent AIDS is avoiding exposure to the virus, which you can control by your own behavior.

Should You Get An AIDS Test?

You have probably heard about the "AIDS Test." The test doesn't actually tell you if you have AIDS. It shows if you have been infected with the virus. It looks for changes in blood that occur after you have been infected.

The Public Health Service recommends you be confidentially counseled and tested if you have had any sexually transmitted disease or shared needles; if you are a man who has had sex with another man; or if you have had sex with a prostitute, male or female. You should be tested if you have had sex with anyone who has done any of these things.

If you are a woman who has been engaging in risky behavior (*see page 3*), and you plan to have a baby or are not using birth control, you should be tested.

Your doctor may advise you to be counseled and tested if you are a hemophiliac, or

have received a blood transfusion between 1978 and 1985.

If you test positive, and find you have been infected with the AIDS virus, you must take steps to protect your partner.

People who have always practiced safe behavior (*see page 3*) do not need to be tested.

There's been a great deal in the press about problems with the test. It is very reliable if it is done by a good laboratory and the results are checked by a physician or counselor.

If you have engaged in risky behavior, speak frankly to a doctor who understands the AIDS problem, or to an AIDS counselor.

For more information, call your local public health agency. They're listed in the government section of your phone book. Or, call your local AIDS hotline. If you can't find the number, call 1-800-342-AIDS.

AIDS - Continued

The Problem Of Drugs And AIDS

Today, in some cities, the sharing of drug needles and syringes by those who shoot drugs is the fastest growing way that the virus is being spread.

No one should shoot drugs. It can result in addiction, poor health, family disruption, emotional disturbances and death. Many drug users are addicted and need to enter a drug treatment program as quickly as possible.

In the meantime, these people must avoid AIDS by not sharing any of the equipment used to prepare and inject illegal drugs.

Sharing drug needles, even once, is an extremely easy way to be infected with the AIDS virus. Blood from an infected person can be trapped in the needle or syringe, and then injected directly into the bloodstream of the next person who uses the needle.

Other kinds of drugs, including alcohol, can also cause problems. Under their influence, your judgment becomes impaired. You could be exposed to the AIDS virus while doing things you wouldn't otherwise do.

Teenagers are at an age when trying different things is especially inviting. They must understand how serious the drug problem is and how to avoid it.

Drugs are also one of the main ways in which prostitutes become infected. They may share needles themselves or have sex with people who do. They then can pass the AIDS virus to others.

For information about drug abuse treatment programs, contact your physician, local public health agency or community AIDS or drug assistance group.

AIDS And Babies

An infected woman can give the AIDS virus to her baby before it is born, or during birth. If a woman is infected, her child has about one chance in two of being born with the virus.

If you are considering having a baby, and think you might have been at risk of being infected with the AIDS virus, even if it was years ago, you should receive counseling and be tested before you get pregnant.

You must have a long talk with the person with whom you're planning to have a child. Even if you have known this person for a long time, there's no way to be sure he or she hasn't been infected in the past, possibly without realizing it. That person needs to think hard and decide if an AIDS test might be a good idea. So should you.



"I quit using drugs five years before my baby was born. I didn't know I was infected with AIDS until he was diagnosed. You have to find out."

—Carmen Reyes
has AIDS

Talking With Kids About AIDS

Children hear about AIDS, just as we all do. But they don't understand it, so they become frightened. They are worried they or their friends might get sick and die.

Children need to be told they can't get AIDS from everyday contact in the classroom, cafeteria or bathrooms. They don't have to worry about getting AIDS even if one of their schoolmates is infected.

Basic health education should be started as early as possible, in keeping with parental and community standards. Local schools have the responsibility to see that their students know the facts about AIDS. It is very important that middle school students — those entering their teens — learn to protect themselves from the AIDS virus.

Children must also be taught values and responsibility, as well as skills to help them resist peer pressure that might lead to risky behavior. These skills can be reinforced by religious and community groups. However, final responsibility rests with the parents. As a parent, you should read and discuss this brochure with your children.

AIDS - Continued

Helping A Person With AIDS

If you are one of the growing number of people who know someone who is infected, you need to have a special understanding of the problem.

No one will require more support and more love than your friend with AIDS. Feel free to offer what you can, without fear of becoming infected.

Don't worry about getting AIDS from everyday contact with a person with AIDS. You need to take precautions such as wearing rubber gloves only when blood is present.

If you don't know anyone with AIDS, but you'd still like to offer a helping hand, become a volunteer. You can be sure your help will be appreciated by a person with AIDS.

This might mean dropping by the supermarket to pick up groceries, sitting with-

the person a while, or just being there to talk. You may even want to enroll in a support group for caregivers. These are available around the country. If you are interested, contact any local AIDS-related organization.

Above all, keep an upbeat attitude. It will help you and everyone face the disease more comfortably.



"If you want more information about AIDS or what you can do to help, contact your physician, community organizations in your area, or the local public health agency."

—James O. Mason, M.D.
Director, Centers for
Disease Control

Do You Know Enough To Talk About AIDS? Try This Quiz

It's important for each of us to share what we know about AIDS with family members and others we love. Knowledge and understanding are the best weapons we have against the disease. Check the boxes. Answers below.

- If you are not in a "high risk group," you still need to be concerned about AIDS.
 True False
- The AIDS virus is not spread through
 - A. insect bites.
 - B. casual contact.
 - C. sharing drug needles.
 - D. sexual intercourse.
- Condoms are an effective, but not foolproof, way to prevent the spread of the AIDS virus.
 True False

- You can't tell by looking that someone has the AIDS virus.

True False

- If you think you've been exposed to the AIDS virus, you should get an AIDS test.

True False

- People who provide help for someone with AIDS are not personally at risk for getting the disease.

True False

ANSWERS

- True. It is risky behavior that puts you at risk for AIDS, regardless of any "group" you belong to. See page 2.
- A & B. The AIDS virus is not spread by insects, kissing, tears, or casual contact. See page 3.
- True. However, the most effective preventive measure against AIDS is not having sex or shooting drugs. Condoms are discussed in detail on page 4.
- True. You cannot tell by looking if someone is infected. The virus by itself is completely invisible. Symptoms may first appear years after you have been infected. See page 5.
- True. You should be counseled about getting an AIDS test if you have been engaging in risky behavior or think you have been exposed to the virus. There's no reason to be tested if you don't engage in this behavior. See page 5.
- True. You won't get AIDS by helping someone who has the disease. See page 7.

AIDS — Continued



Under- standing AIDS

What Do You Really Know About AIDS?

Are You At Risk?

AIDS And Sex

Why No One Has Gotten AIDS From Mosquitoes



OTIS R. BOWEN, M.D.,
Secretary
U.S. Department of Health and Human Services



ROBERT E. WINDOM, M.D.,
Assistant Secretary for Health
U.S. Department of Health and Human Services

This brochure has been prepared by the Surgeon General and the Centers for Disease Control, U.S. Public Health Service. The Centers for Disease Control is the government agency responsible for the prevention and control of diseases, including AIDS, in the United States.

Epidemiologic Notes and Reports**Human Ehrlichiosis — United States**

Human infection with *Ehrlichia canis* or another closely related rickettsia was described in the United States for the first time in 1986 (1). In April of that year, a 51-year-old man developed fever, malaise, myalgia, and headache approximately 12 days after being bitten by ticks while he was planting trees in rural Arkansas. He was hospitalized 5 days after becoming ill.

Upon admission to the hospital, the patient had an oral temperature of 39.7 °C (103.5 °F), leukopenia, thrombocytopenia, renal failure, and elevated liver enzymes, but no rash. A presumptive diagnosis of "spotless" Rocky Mountain spotted fever (RMSF) was made, and the patient was treated with chloramphenicol and, later, with doxycycline. Cytoplasmic inclusions were observed in peripheral lymphocytes, neutrophils, and monocytes on the seventh day of illness. His illness was complicated

(Continued on page 275)

TABLE I. Summary — cases of specified notifiable diseases, United States

| Disease | 17th Week Ending | | | Cumulative, 17th Week Ending | | |
|---|-------------------|----------------|---------------------|------------------------------|----------------|---------------------|
| | April 30, 1988 | May 2, 1987 | Median 1983-1987 | April 30, 1988 | May 2, 1987 | Median 1983-1987 |
| Acquired Immunodeficiency Syndrome (AIDS) | 286 | U * | 180 | 9,945 | 6,254 | 2,207 |
| Aseptic meningitis | 60 | 92 | 81 | 1,216 | 1,510 | 1,365 |
| Encephalitis: Primary (arthropod-borne & unspec) | 9 | 19 | 16 | 199 | 276 | 276 |
| Post-infectious | 4 | 4 | 4 | 27 | 25 | 33 |
| Genorrhoea: Civilian | 11,406 | 14,904 | 16,106 | 216,175 | 264,018 | 268,403 |
| Military | 337 | 237 | 433 | 4,081 | 5,603 | 6,657 |
| Hepatitis: Type A | 386 | 434 | 434 | 7,786 | 8,153 | 7,356 |
| Type B | 467 | 500 | 496 | 6,665 | 8,243 | 7,999 |
| Non A, Non B | 59 | 59 | 80 | 793 | 1,029 | 1,119 |
| Unspecified | 51 | 50 | 101 | 704 | 1,084 | 1,617 |
| Legionellosis | 11 | 21 | 17 | 221 | 269 | 211 |
| Leprosy | 6 | 10 | 7 | 59 | 73 | 90 |
| Malaria | 3 | 21 | 21 | 211 | 230 | 230 |
| Measles: Total† | 40 | 100 | 141 | 769 | 1,277 | 1,023 |
| Indigenous | 40 | 77 | 129 | 671 | 1,087 | 906 |
| Imported | - | 23 | 12 | 88 | 180 | 118 |
| Meningococcal infections | 64 | 55 | 62 | 1,182 | 1,287 | 1,153 |
| Mumps | 128 | 523 | 77 | 1,736 | 6,498 | 1,368 |
| Pertussis | 25 | 24 | 33 | 712 | 577 | 585 |
| Rubella (German measles) | 4 | 7 | 13 | 66 | 106 | 173 |
| Syphilis (Primary & Secondary): Civilian | 859 | 645 | 619 | 12,168 | 10,952 | 9,290 |
| Military | 3 | 4 | 9 | 64 | 67 | 79 |
| Toxic Shock syndrome | 3 | 9 | 11 | 92 | 108 | 130 |
| Tuberculosis | 352 | 438 | 478 | 5,836 | 6,415 | 6,415 |
| Tularemia | 2 | 5 | 1 | 30 | 36 | 27 |
| Typhoid Fever | 4 | 3 | 6 | 108 | 90 | 90 |
| Typhus fever, tick-borne (RMSF) | 1 | 4 | 8 | 22 | 21 | 34 |
| Rabies, animal | 70 | 105 | 153 | 1,230 | 1,581 | 1,581 |

TABLE II. Notifiable diseases of low frequency, United States

| | Cum. 1988 | Cum. 1988 |
|------------------------------------|-----------|-----------|
| Anthrax | - | 9 |
| Botulism: Foodborne | 4 | 1 |
| Infant (Maryland 1) | 12 | - |
| Other | 2 | 24 |
| Brucellosis | 15 | - |
| Cholera | - | - |
| Congenital rubella syndrome | 1 | 13 |
| Congenital syphilis, ages < 1 year | - | 6 |
| Diphtheria | - | - |
| Leptospirosis | | |
| Plague | | |
| Poliomyelitis, Paralytic | | |
| Poxvirus (Ohio 1) | | |
| Rebabs, human | | |
| Tetanus (Tex. 1) | | |
| Trichinosis | | |

*Because AIDS cases are not received weekly from all reporting areas, comparison of weekly figures may be misleading.

†There were no imported measles cases this week.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending April 30, 1988 and May 2, 1987 (17th Week)

| Reporting Area | AIDS | Aseptic Meningitis | | Encephalitis | | Gonorrhea (Civilian) | | Hepatitis (Viral), by type | | | | Legionnaires | Lapsoesy | | |
|----------------|-------|--------------------|--------------|--------------|-----------------|----------------------|--------------|----------------------------|--------------|--------------|--------------|--------------|----------|--|--|
| | | Cum. 1988 | Cum. 1986 | Primary | Post-infectious | Cum. 1988 | Cum. 1987 | Cum. 1988 | Cum. 1986 | Cum. 1988 | Cum. 1986 | | | | |
| | | | | | | | | | | | | | | | |
| UNITED STATES | 9,845 | 1,216 | 186 | 27 | 216,175 | 264,018 | 7,786 | 6,865 | 783 | 704 | 221 | 59 | | | |
| NEW ENGLAND | 372 | 59 | 9 | - | 6,588 | 8,862 | 276 | 432 | 73 | 39 | 10 | 9 | | | |
| Maine | 14 | 5 | 1 | - | 148 | 275 | 13 | 21 | 3 | 1 | 1 | - | | | |
| N.H. | 9 | 10 | - | - | 103 | 149 | 17 | 18 | 4 | 3 | 1 | - | | | |
| Vt. | 3 | 3 | 3 | - | 52 | 66 | 3 | 13 | 5 | - | - | | | | |
| Mass. | 203 | 25 | 4 | - | 2,354 | 3,283 | 151 | 267 | 49 | 30 | 6 | 8 | | | |
| R.I. | 13 | 13 | - | - | 568 | 738 | 41 | 49 | 8 | - | 2 | 1 | | | |
| Conn. | 130 | 3 | 1 | - | 3,343 | 4,371 | 50 | 54 | 4 | 5 | - | - | | | |
| MID. ATLANTIC | 3,558 | 145 | 22 | - | 32,800 | 41,888 | 452 | 864 | 50 | 69 | 45 | 4 | | | |
| Upstate N.Y. | 461 | 82 | 16 | - | 4,309 | 5,445 | 286 | 237 | 27 | 8 | 24 | - | | | |
| N.Y. City | 2,092 | 26 | 5 | - | 13,750 | 22,310 | 72 | 407 | 4 | 49 | 2 | 4 | | | |
| N.J. | 727 | 37 | 1 | - | 4,958 | 5,243 | 94 | 220 | 18 | 12 | - | - | | | |
| Pa. | 278 | - | - | - | 9,583 | 9,890 | - | - | - | - | 19 | - | | | |
| E.N. CENTRAL | 683 | 154 | 35 | 2 | 33,867 | 38,112 | 387 | 666 | 42 | 42 | 64 | - | | | |
| Ohio | 140 | 63 | 16 | 2 | 7,954 | 8,244 | 118 | 155 | 14 | 7 | 23 | - | | | |
| Ind. | 52 | 26 | 5 | - | 2,843 | 3,214 | 51 | 108 | 4 | 15 | 5 | - | | | |
| Ill. | 325 | 2 | - | - | 9,800 | 11,486 | 37 | 40 | - | 3 | - | - | | | |
| Mich. | 134 | 55 | 9 | - | 11,058 | 11,817 | 139 | 200 | 17 | 17 | 27 | - | | | |
| Wis. | 32 | 8 | 5 | - | 2,412 | 3,371 | 52 | 73 | 7 | - | 9 | - | | | |
| W.N. CENTRAL | 222 | 61 | 14 | 3 | 8,781 | 10,468 | 480 | 341 | 35 | 12 | 15 | - | | | |
| Minn. | 42 | 13 | 2 | - | 1,184 | 1,728 | 20 | 47 | 5 | 3 | - | - | | | |
| Iowa | 11 | 12 | 7 | - | 650 | 986 | 26 | 32 | 6 | - | 4 | - | | | |
| Mo. | 113 | 16 | - | - | 4,976 | 5,435 | 262 | 203 | 17 | 6 | 2 | - | | | |
| N. Dak. | - | - | - | - | 47 | 118 | 2 | 2 | 1 | 1 | 1 | - | | | |
| S. Dak. | 3 | 5 | - | 1 | 187 | 208 | - | 1 | 2 | - | 5 | - | | | |
| Nebr. | 16 | 3 | 1 | 2 | 537 | 605 | 17 | 18 | - | - | 2 | - | | | |
| Kans. | 37 | 12 | 4 | - | 1,200 | 1,389 | 153 | 38 | 4 | 2 | 1 | - | | | |
| S. ATLANTIC | 1,494 | 282 | 28 | 10 | 61,652 | 69,065 | 627 | 1,372 | 107 | 112 | 41 | 1 | | | |
| Del. | 14 | 6 | 2 | - | 867 | 1,038 | 10 | 40 | 4 | 1 | 4 | - | | | |
| Md. | 150 | 29 | 3 | 2 | 6,176 | 7,627 | 72 | 217 | 7 | 3 | 5 | - | | | |
| D.C. | 169 | 8 | - | - | 4,078 | 4,688 | 6 | 17 | 3 | 1 | - | - | | | |
| Va. | 126 | 29 | 13 | 2 | 4,241 | 5,261 | 129 | 89 | 23 | 79 | 5 | - | | | |
| W. Va. | 5 | 7 | 1 | - | 527 | 532 | 3 | 25 | 2 | 3 | - | - | | | |
| N.C. | 93 | 47 | 7 | - | 10,123 | 10,405 | 125 | 237 | 29 | - | 14 | - | | | |
| S.C. | 60 | 4 | - | - | 4,613 | 5,815 | 18 | 202 | 4 | 3 | 5 | - | | | |
| Ga. | 185 | 34 | 1 | - | 12,107 | 11,766 | 109 | 233 | 8 | 2 | 4 | - | | | |
| Fla. | 682 | 118 | 1 | 6 | 18,820 | 21,933 | 158 | 312 | 29 | 20 | 4 | - | | | |
| E.S. CENTRAL | 258 | 85 | 18 | 5 | 16,581 | 19,236 | 326 | 422 | 59 | 6 | 8 | 1 | | | |
| Ky. | 34 | 29 | 5 | 1 | 1,377 | 1,977 | 289 | 82 | 26 | 2 | 4 | - | | | |
| Tenn. | 120 | 10 | 5 | - | 5,517 | 5,587 | 24 | 204 | 15 | - | 2 | - | | | |
| Ala. | 68 | 36 | 8 | 2 | 5,667 | 6,233 | 4 | 110 | 16 | 4 | 2 | - | | | |
| Miss. | 36 | 10 | - | 2 | 4,100 | 4,399 | 9 | 26 | 2 | - | - | - | | | |
| W.S. CENTRAL | 948 | 107 | 14 | - | 24,897 | 29,843 | 782 | 463 | 61 | 163 | 9 | 10 | | | |
| Ark. | 30 | 3 | 2 | - | 2,239 | 2,962 | 95 | 26 | 1 | 3 | 2 | - | | | |
| La. | 130 | 17 | 1 | - | 5,337 | 5,393 | 47 | 108 | 10 | 7 | 3 | - | | | |
| Okla. | 35 | 11 | 4 | - | 2,230 | 3,216 | 203 | 57 | 17 | 14 | 4 | - | | | |
| Tex. | 651 | 76 | 7 | - | 16,081 | 18,272 | 437 | 262 | 33 | 139 | - | 10 | | | |
| MOUNTAIN | 336 | 51 | 18 | 1 | 4,812 | 6,968 | 1,111 | 522 | 83 | 75 | 12 | - | | | |
| Mont. | 5 | 2 | - | - | 134 | 168 | 17 | 20 | 4 | 3 | - | - | | | |
| Idaho | 3 | 1 | - | - | 132 | 241 | 54 | 33 | 2 | 1 | - | - | | | |
| Wyo. | 1 | 1 | - | - | 73 | 127 | 1 | 4 | 3 | - | 1 | - | | | |
| Colo. | 121 | 16 | 2 | - | 1,068 | 1,484 | 72 | 65 | 13 | 35 | 4 | - | | | |
| N. Mex. | 15 | 1 | 1 | - | 457 | 744 | 200 | 62 | 4 | 1 | 1 | - | | | |
| Ariz. | 117 | 17 | 5 | - | 1,820 | 2,549 | 575 | 224 | 34 | 22 | 3 | - | | | |
| Utah | 25 | 7 | 3 | 1 | 217 | 234 | 124 | 41 | 17 | 11 | 2 | - | | | |
| Nev. | 49 | 6 | 6 | - | 911 | 1,401 | 68 | 73 | 6 | 2 | 1 | - | | | |
| PACIFIC | 2,176 | 272 | 43 | 6 | 26,596 | 39,535 | 3,338 | 1,583 | 283 | 186 | 17 | 34 | | | |
| Wash. | 108 | - | 2 | 3 | 2,137 | 2,861 | 700 | 198 | 46 | 19 | 6 | 2 | | | |
| Oreg. | 71 | - | - | - | 977 | 1,450 | 620 | 227 | 32 | 8 | - | - | | | |
| Calif. | 1,952 | 242 | 39 | 3 | 22,881 | 34,264 | 1,912 | 1,115 | 201 | 155 | 9 | 31 | | | |
| Alaska | 7 | 7 | 1 | - | 349 | 615 | 100 | 31 | 3 | 3 | - | 1 | | | |
| Hawaii | 38 | 23 | 1 | - | 242 | 336 | 4 | 12 | 1 | 1 | 2 | - | | | |
| Guam | - | - | - | - | 35 | 64 | 2 | 3 | - | 2 | - | 3 | | | |
| P.R. | 383 | 10 | 2 | - | 480 | 718 | 9 | 86 | 18 | 15 | - | - | | | |
| V.I. | 9 | - | - | - | 118 | 78 | - | 3 | - | - | - | - | | | |
| Amer. Samoa | - | - | - | - | - | 183 | - | - | - | - | - | - | | | |
| C.N.M.I. | - | - | - | - | 13 | 35 | - | 1 | - | - | - | - | | | |

N: Not notifiable

U: Unavailable

C.N.M.I.: Commonwealth of the Northern Mariana Islands

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending April 30, 1988 and May 2, 1987 (17th Week)

| Reporting Area | Malaria | Measles (Rubella) | | | | | | Meningo- encephalitis Infections | Mumps | | | Pertussis | | | Rubella | | |
|----------------|---------|-------------------|------|--------------|------|--------------|--------------|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | Indigenous | | Imported* | | Total | Cum. 1988 | | Cum. 1988 | Cum. 1988 | Cum. 1987 | Cum. 1988 | Cum. 1988 | Cum. 1988 | Cum. 1987 | Cum. 1988 | Cum. 1987 |
| | | Cum. 1988 | 1988 | Cum. 1988 | 1988 | Cum. 1988 | Cum. 1987 | | 1988 | 1988 | 1988 | Cum. 1988 | Cum. 1988 | Cum. 1987 | 1988 | Cum. 1988 | Cum. 1987 |
| UNITED STATES | 211 | 49 | 671 | - | 86 | 1,277 | 1,182 | 128 | 1,736 | 25 | 712 | 577 | 4 | 89 | 106 | | |
| NEW ENGLAND | 19 | - | 2 | - | 44 | 107 | 96 | 17 | 23 | 2 | 77 | 15 | 1 | 1 | - | | |
| Maine | 2 | - | - | - | - | 3 | 3 | - | - | - | 11 | - | - | - | - | - | - |
| N.H. | - | - | 1 | - | 43 | 92 | 11 | 17 | 20 | 1 | 22 | 2 | - | - | - | - | - |
| Vt. | - | - | - | - | - | 6 | 4 | - | - | - | 1 | 3 | - | - | - | - | - |
| Mass. | 12 | - | 1 | - | - | 2 | 40 | - | 3 | - | 33 | 3 | - | - | - | - | - |
| R.I. | 3 | - | - | - | - | - | 15 | - | - | - | 1 | 1 | - | - | - | - | - |
| Conn. | 2 | - | - | - | 1 | 4 | 23 | - | - | 1 | 9 | 7 | - | - | - | - | - |
| MID. ATLANTIC | 26 | 6 | 182 | - | 2 | 172 | 99 | 6 | 171 | 1 | 21 | 79 | 2 | 7 | 3 | | |
| Upstate N.Y. | 13 | 1 | 1 | - | 2 | 17 | 55 | 1 | 34 | - | 8 | 62 | 1 | 1 | - | - | - |
| N.Y. City | 7 | 3 | 21 | - | - | 114 | 19 | 4 | 49 | - | 1 | 2 | 4 | 1 | 1 | - | - |
| N.J. | 4 | 2 | 2 | - | - | 8 | 26 | 1 | 22 | 1 | 2 | 4 | - | 1 | 1 | - | - |
| Pa. | 2 | - | 166 | - | - | 33 | - | - | 66 | - | 10 | 13 | - | 1 | - | - | - |
| E.N. CENTRAL | 9 | 4 | 48 | - | 4 | 164 | 119 | 9 | 416 | 1 | 75 | 78 | - | 20 | 17 | | |
| Ohio | 1 | - | - | - | 3 | 4 | 46 | - | 48 | - | 16 | 25 | - | - | - | - | - |
| Ind. | - | - | - | - | - | - | 12 | 2 | 38 | - | 38 | 1 | - | - | - | - | - |
| Ill. | - | 4 | 37 | - | - | 75 | 2 | - | 139 | - | 2 | 5 | - | 16 | 16 | - | - |
| Mich. | 7 | - | 12 | - | 1 | 23 | 42 | 7 | 129 | 1 | 14 | 22 | - | 4 | 1 | - | - |
| Wis. | 1 | - | - | - | - | 62 | 17 | - | 61 | - | 5 | 25 | - | - | - | - | - |
| W.N. CENTRAL | 6 | - | - | - | - | 40 | 46 | 8 | 98 | 1 | 35 | 34 | - | - | 1 | - | - |
| Minn. | 2 | - | - | - | - | 3 | 13 | - | - | - | 5 | 7 | - | - | - | - | - |
| Iowa | - | - | - | - | - | - | - | - | 25 | - | 14 | 3 | - | - | 1 | - | - |
| Mo. | 3 | - | - | - | - | 35 | 17 | - | 22 | - | 5 | 13 | - | - | - | - | - |
| N. Dak. | - | - | - | - | - | - | 1 | - | - | - | 8 | 2 | - | - | - | - | - |
| S. Dak. | - | - | - | - | - | - | 1 | - | - | - | 2 | 2 | - | - | - | - | - |
| Nebr. | - | - | - | - | - | - | 5 | 6 | 11 | - | - | - | - | - | - | - | - |
| Kans. | 1 | - | - | - | - | 1 | 10 | - | 26 | 1 | 3 | 7 | - | - | - | - | - |
| S. ATLANTIC | 26 | 13 | 149 | - | 9 | 40 | 206 | 18 | 163 | 2 | 80 | 120 | - | 1 | 9 | | |
| Del. | - | - | - | - | - | 1 | 1 | - | - | - | 3 | - | - | - | - | - | - |
| Md. | 2 | - | 1 | - | 2 | - | 22 | - | 9 | - | 12 | 2 | - | - | 2 | - | - |
| D.C. | 5 | - | - | - | - | 1 | 6 | 12 | 74 | - | - | - | - | - | - | - | - |
| Va. | 6 | 13 | 50 | - | 2 | - | 25 | - | 29 | - | 7 | 33 | - | - | 1 | - | - |
| W. Va. | - | - | 6 | - | - | - | - | - | 4 | - | - | 16 | - | - | - | - | - |
| N.C. | 5 | - | - | - | 1 | - | 33 | 2 | 21 | 1 | 23 | 52 | - | - | - | - | - |
| S.C. | 3 | - | - | - | - | - | 21 | - | 3 | - | - | - | - | - | - | - | - |
| Ga. | 2 | - | - | - | - | - | 33 | 3 | 11 | 1 | 14 | 13 | - | 1 | 5 | - | - |
| Fla. | 6 | - | 83 | - | 4 | 38 | 65 | 2 | 12 | - | 1 | 4 | - | 1 | 5 | - | - |
| E.S. CENTRAL | 4 | - | 5 | - | - | 1 | 115 | 6 | 234 | - | 10 | 7 | - | - | 2 | - | - |
| Ky. | - | - | - | - | - | - | 20 | 2 | 60 | - | - | 1 | - | - | 2 | - | - |
| Tenn. | - | - | - | - | - | - | 68 | 4 | 156 | - | 7 | 1 | - | - | - | - | - |
| Ala. | 3 | - | - | - | - | - | 19 | - | 6 | - | 2 | 3 | - | - | - | - | - |
| Miss. | 1 | - | 6 | - | - | 1 | 8 | N | N | - | 1 | 2 | - | - | - | - | - |
| W.S. CENTRAL | 18 | - | 9 | - | - | 75 | 79 | 40 | 310 | 2 | 31 | 40 | - | 4 | 1 | - | - |
| Ark. | - | - | - | - | - | - | 10 | - | 3 | - | 5 | 2 | - | 3 | - | - | - |
| La. | 2 | - | - | - | - | - | 25 | 11 | 129 | - | 2 | 9 | - | - | - | - | - |
| Okla. | 5 | - | 8 | - | - | 1 | 8 | 23 | 94 | 2 | 24 | 29 | - | - | 1 | - | - |
| Tex. | 11 | - | 1 | - | - | 74 | 38 | 6 | 84 | - | - | - | - | - | - | - | - |
| MOUNTAIN | 10 | - | 113 | - | - | 258 | 37 | 10 | 104 | 12 | 278 | 52 | - | 2 | 6 | - | - |
| Mont. | 1 | - | - | - | - | 17 | - | 2 | 2 | - | 1 | 2 | - | - | - | - | - |
| Idaho | - | - | - | - | - | - | 3 | - | 1 | 11 | 228 | 19 | - | - | 1 | - | - |
| Wyo. | - | - | - | - | - | - | - | - | 2 | - | 1 | 2 | - | - | - | - | - |
| Colo. | 4 | - | 113 | - | - | - | 9 | 2 | 23 | 1 | 7 | 17 | - | 1 | - | - | - |
| N. Mex. | 1 | - | - | - | - | 239 | 8 | N | N | - | 1 | 3 | - | - | - | - | - |
| Ariz. | 2 | - | - | - | - | 2 | 10 | 6 | 65 | - | 18 | 8 | - | - | 4 | - | - |
| Utah | 1 | - | - | - | - | - | 6 | - | 2 | - | 19 | 1 | - | - | - | - | - |
| Nev. | 1 | - | - | - | - | - | 1 | - | 8 | - | 1 | - | - | - | - | - | - |
| PACIFIC | 90 | 26 | 152 | - | 29 | 420 | 385 | 13 | 236 | 4 | 127 | 152 | 1 | 34 | 67 | | |
| Wash. | 6 | - | - | - | - | 1 | 29 | - | 10 | - | 26 | 22 | - | - | - | - | - |
| Oreg. | 5 | - | - | - | - | - | 34 | 19 | N | - | 3 | 13 | - | - | 1 | - | - |
| Calif. | 78 | 26 | 152 | - | 28 | 381 | 320 | 12 | 222 | 4 | 76 | 70 | - | 30 | 58 | | |
| Aleks. | 1 | - | - | - | - | - | - | 4 | - | 6 | - | 3 | 3 | - | - | - | - |
| Hawaii | - | - | - | - | 1 | 4 | 13 | 1 | 1 | - | 19 | 44 | 1 | 4 | 8 | - | - |
| Guam | - | - | - | - | 1 | 2 | - | - | 2 | - | - | - | - | 1 | - | - | - |
| P.R. | 1 | - | 100 | - | - | 342 | 5 | 1 | 5 | - | 5 | 11 | - | - | - | - | - |
| V.I. | - | - | - | - | - | - | - | 11 | - | - | - | - | - | - | - | - | - |
| Amer. Samoa | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | 1 | - | - |
| C.N.M.I. | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

*For measles only. Imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable ¹International ²Out-of-state

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending April 30, 1988 and May 2, 1987 (17th Week)

| Reporting Area | Syphilis (Civilian) (Primary & Secondary) | | Toxic- shock Syndrome | Tuberculosis | | Tula- remia | Typhoid Fever | Typhus Fever (Tick-borne) (RMSEF) | Rabies, Animal |
|----------------|--|--------------|-----------------------------|--------------|--------------|----------------|------------------|---|-------------------|
| | Cum. 1988 | Cum. 1987 | | Cum. 1988 | Cum. 1987 | | | | |
| UNITED STATES | 12,186 | 10,952 | 92 | 5,836 | 6,415 | 30 | 108 | 22 | 1,230 |
| NEW ENGLAND | 335 | 156 | 9 | 114 | 184 | 1 | 7 | - | 3 |
| Maine | 5 | 1 | 1 | 3 | 14 | - | - | - | 1 |
| N.H. | 3 | 2 | 3 | - | 5 | - | - | - | 2 |
| Vt. | - | 1 | 2 | - | 4 | - | - | - | - |
| Mass. | 138 | 79 | 3 | 73 | 86 | 1 | 5 | - | - |
| R.I. | 12 | 4 | - | 9 | 16 | - | - | - | - |
| Conn. | 177 | 69 | - | 29 | 58 | - | 2 | - | - |
| MID. ATLANTIC | 2,357 | 1,900 | 14 | 1,025 | 1,190 | - | 17 | 2 | 133 |
| Upstate N.Y. | 156 | 71 | 7 | 184 | 183 | - | 2 | 1 | 1 |
| N.Y. City | 1,518 | 1,331 | 2 | 417 | 569 | - | 8 | 1 | - |
| N.J. | 287 | 211 | 2 | 207 | 214 | - | 7 | - | - |
| Pa. | 396 | 287 | 3 | 217 | 224 | - | - | - | 132 |
| E.N. CENTRAL | 394 | 331 | 13 | 728 | 754 | 1 | 11 | - | 22 |
| Ohio | 44 | 36 | 10 | 132 | 159 | - | 3 | - | - |
| Ind. | 18 | 18 | - | 75 | 72 | - | 2 | - | 3 |
| Ill. | 200 | 190 | - | 298 | 310 | - | 5 | - | 6 |
| Mich. | 123 | 61 | 3 | 182 | 188 | 1 | 1 | - | 4 |
| Wis. | 9 | 26 | - | 42 | 25 | - | - | - | 10 |
| W.N. CENTRAL | 81 | 43 | 13 | 168 | 179 | 14 | 3 | 2 | 150 |
| Minn. | 8 | 5 | - | 30 | 46 | - | 1 | - | 61 |
| Iowa | 9 | 7 | 2 | 14 | 10 | - | - | - | 13 |
| Mo. | 40 | 22 | 6 | 83 | 89 | 11 | 2 | 2 | 26 |
| N. Dak. | 1 | - | - | 3 | 1 | - | - | - | 32 |
| S. Dak. | 5 | 5 | 1 | 16 | 9 | - | - | - | 3 |
| Nebr. | 12 | 3 | 2 | 4 | 11 | 2 | - | - | 10 |
| Kans. | 6 | 1 | 2 | 18 | 13 | 1 | - | - | - |
| S. ATLANTIC | 4,344 | 3,780 | 9 | 1,330 | 1,286 | 4 | 18 | 12 | 414 |
| Del. | 49 | 33 | - | 13 | 12 | 1 | - | - | 18 |
| Md. | 233 | 201 | 1 | 135 | 104 | - | 1 | - | 94 |
| D.C. | 196 | 101 | - | 62 | 42 | - | - | - | 3 |
| Va. | 139 | 83 | - | 146 | 111 | 2 | 7 | - | 148 |
| W. Va. | 1 | 5 | - | 32 | 41 | - | - | - | 30 |
| N.C. | 256 | 199 | 5 | 98 | 128 | - | 1 | 10 | - |
| S.C. | 185 | 251 | - | 135 | 125 | - | - | 2 | 72 |
| Ge. | 706 | 524 | - | 214 | 184 | 1 | 2 | - | 29 |
| Fla. | 2,577 | 2,383 | 3 | 495 | 529 | - | 5 | - | - |
| E.S. CENTRAL | 697 | 683 | 11 | 463 | 503 | 4 | 2 | 3 | 114 |
| Ky. | 22 | 6 | 4 | 127 | 116 | 3 | 1 | - | 52 |
| Tenn. | 303 | 293 | 4 | 100 | 161 | - | - | 1 | 32 |
| Ala. | 194 | 174 | 3 | 155 | 173 | - | 1 | 2 | 30 |
| Miss. | 178 | 210 | - | 81 | 53 | 1 | - | - | - |
| W.S. CENTRAL | 1,310 | 1,406 | 7 | 730 | 706 | 3 | 2 | 1 | 176 |
| Ark. | 61 | 70 | - | 71 | 73 | 1 | - | - | 36 |
| La. | 247 | 246 | - | 113 | 104 | - | 2 | - | - |
| Okla. | 49 | 52 | 2 | 70 | 72 | 2 | - | 1 | 14 |
| Tex. | 963 | 1,038 | 5 | 476 | 457 | - | - | - | 126 |
| MOUNTAIN | 236 | 240 | 9 | 119 | 198 | 3 | 5 | 1 | 101 |
| Mont. | 2 | 7 | - | - | 8 | - | 1 | - | 82 |
| Idaho | - | 1 | 2 | 2 | 16 | - | - | 1 | - |
| Wyo. | - | - | - | 1 | 1 | - | - | - | 7 |
| Colo. | 30 | 32 | 1 | 8 | 35 | 3 | 3 | - | - |
| N. Mex. | 19 | 21 | - | 32 | 34 | - | - | - | 4 |
| Ariz. | 63 | 120 | 2 | 58 | 68 | - | 1 | - | 7 |
| Utah | 8 | 8 | 4 | - | 6 | - | - | - | 1 |
| Nev. | 114 | 51 | - | 18 | 10 | - | - | - | - |
| PACIFIC | 2,412 | 2,433 | 7 | 1,158 | 1,415 | - | 46 | 1 | 117 |
| Wash. | 61 | 45 | - | 75 | 65 | - | 3 | - | - |
| Oreg. | 100 | 96 | - | 40 | 41 | - | 5 | - | - |
| Calif. | 2,235 | 2,295 | 7 | 979 | 1,218 | - | 36 | 1 | 113 |
| Alaska | 4 | 2 | - | 12 | 25 | - | - | - | 4 |
| Hawaii | 12 | 5 | - | 52 | 68 | - | 2 | - | - |
| Guam | - | 1 | - | 7 | 4 | - | - | - | - |
| P.R. | 212 | 316 | - | 74 | 98 | - | 2 | - | 23 |
| V.I. | 1 | 3 | - | 3 | 2 | - | - | - | - |
| Amer. Samoa | - | 83 | - | - | 54 | - | - | - | - |
| C.N.M.I. | - | 2 | - | - | - | - | - | - | - |

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending April 30, 1988 (17th Week)

| Reporting Area | All Causes, By Age (Years) | | | | | PM** Total | Reporting Area | All Causes, By Age (Years) | | | | | PM** Total | | |
|------------------------------|----------------------------|-------|-------|-------|------|---------------|----------------|----------------------------|---------------------|-------|-------|-------|---------------|-----|-----|
| | All Age | >65 | 45-64 | 25-44 | 1-24 | | | All Age | >65 | 45-64 | 25-44 | 1-24 | | | |
| NEW ENGLAND | 695 | 492 | 128 | 47 | 9 | 19 | 76 | S. ATLANTIC | 1,348 | 789 | 309 | 149 | 52 | 49 | 70 |
| Boston, Mass. | 215 | 142 | 40 | 20 | 3 | 10 | 30 | Atlanta, Ga. | 162 | 92 | 40 | 21 | 5 | 4 | 4 |
| Bridgeport, Conn. | 44 | 31 | 9 | 3 | 1 | - | 4 | Baltimore, Md. | 303 | 178 | 64 | 39 | 11 | 11 | 17 |
| Cambridge, Mass. | 19 | 14 | 4 | 1 | - | - | 1 | Charlotte, N.C. | 85 | 61 | 18 | - | 2 | 4 | 6 |
| Fall River, Mass. | 22 | 17 | 5 | - | - | - | 2 | Jacksonville, Fla. | 108 | 63 | 24 | 13 | 6 | 2 | 7 |
| Hartford, Conn. | 46 | 30 | 10 | 6 | 1 | 2 | 1 | Miami, Fla. | 147 | 75 | 39 | 16 | 11 | 6 | - |
| Lowell, Mass. | 33 | 25 | 8 | - | - | - | 5 | Norfolk, Va. | 41 | 27 | 5 | 3 | 1 | 5 | 6 |
| Lynn, Mass. | 22 | 15 | 6 | 1 | - | - | 1 | Richmond, Va. | 71 | 42 | 14 | 9 | 2 | 4 | 7 |
| New Bedford, Mass. | 28 | 19 | 6 | 2 | 1 | - | 1 | Savannah, Ga. | 51 | 30 | 15 | 3 | - | 3 | 4 |
| New Haven, Conn. | 61 | 42 | 12 | 5 | - | 2 | 2 | St. Petersburg, Fla. | 80 | 46 | 17 | 8 | 6 | 3 | 2 |
| Providence, R.I. | 40 | 34 | 10 | 3 | - | 2 | 2 | Tampa, Fla. | 78 | 46 | 22 | 7 | - | 2 | 6 |
| Somerville, Mass. | 10 | 8 | 2 | - | - | - | 3 | Washington, D.C. | 202 | 116 | 47 | 26 | - | 5 | 11 |
| Springfield, Mass. | 47 | 38 | 5 | 2 | 2 | - | 10 | Wilmington, Del. | 21 | 13 | 4 | 4 | - | - | - |
| Waterbury, Conn. | 31 | 23 | 4 | 2 | 1 | 1 | 2 | E.S. CENTRAL | 766 | 514 | 150 | 59 | 26 | 17 | 38 |
| Worcester, Mass. | 65 | 54 | 7 | 2 | - | 2 | 10 | Birmingham, Ala. | 134 | 94 | 20 | 14 | 4 | 2 | 4 |
| MID. ATLANTIC | 2,860 | 1,887 | 544 | 285 | 69 | 75 | 158 | Chattanooga, Tenn. | 70 | 44 | 16 | 4 | 2 | 4 | 1 |
| Albany, N.Y. | 46 | 27 | 12 | 5 | 2 | - | 4 | Knoxville, Tenn. | 76 | 47 | 20 | 6 | 5 | - | 1 |
| Allentown, Pa. | 9 | 7 | - | 2 | - | - | 1 | Louisville, Ky. | 89 | 61 | 17 | 6 | 2 | 3 | 3 |
| Buffalo, N.Y. | 113 | 74 | 25 | 12 | - | 2 | 12 | Memphis, Tenn. | 158 | 98 | 32 | 14 | 11 | 3 | 20 |
| Camden, N.J. | 34 | 18 | 7 | 2 | 5 | - | 2 | Mobile, Ala. | 61 | 45 | 9 | 4 | 2 | 1 | 3 |
| Elizabeth, N.J. | 23 | 16 | 6 | 1 | - | - | 2 | Montgomery, Ala. | 53 | 37 | 12 | 4 | - | - | 2 |
| Erie, Pa. ^t | 45 | 30 | 11 | 3 | - | 1 | 8 | Nashville, Tenn. | 125 | 88 | 24 | 9 | - | 4 | 4 |
| Jersey City, N.J. | 47 | 26 | 10 | 5 | 2 | 4 | 4 | W.S. CENTRAL | 1,347 | 833 | 286 | 136 | 44 | 48 | 58 |
| N.J. City, N.Y. | 1,512 | 969 | 275 | 174 | 39 | 35 | 62 | Austin, Tex. | 56 | 36 | 9 | 7 | 2 | 2 | 5 |
| Newark, N.J. | 68 | 31 | 15 | 11 | 3 | 8 | 4 | Baton Rouge, La. | 27 | 20 | 3 | 3 | 1 | - | - |
| Paterson, N.J. | 46 | 29 | 9 | 5 | 1 | - | 2 | Corpus Christi, Tex. | 78 | 52 | 19 | 2 | 1 | 4 | 5 |
| Philadelphia, Pa. | 446 | 289 | 90 | 41 | 15 | 11 | 25 | Dallas, Tex. | 175 | 108 | 35 | 19 | 6 | 7 | 4 |
| Pittsburgh, Pa. ^t | 76 | 52 | 18 | 4 | - | 2 | 2 | El Paso, Tex. | 63 | 39 | 17 | 1 | 3 | 3 | 5 |
| Reading, Pa. | 35 | 28 | 5 | 1 | - | - | 7 | Fort Worth, Tex. | 113 | 73 | 22 | 10 | 3 | 5 | 3 |
| Rochester, N.Y. | 116 | 95 | 14 | 4 | 1 | - | 2 | Houston, Tex. ^s | 308 | 176 | 74 | 34 | 13 | 11 | 7 |
| Schenectady, N.Y. | 36 | 28 | 4 | 3 | - | 1 | 4 | Little Rock, Ark. | 69 | 48 | 6 | 10 | 2 | 3 | 6 |
| Scranton, Pa. ^t | 33 | 25 | 5 | 3 | - | - | 5 | New Orleans, La. | 139 | 82 | 31 | 17 | 6 | 3 | - |
| Syracuse, N.Y. | 63 | 55 | 22 | 2 | 1 | 3 | 3 | San Antonio, Tex. | 195 | 118 | 44 | 25 | 4 | 4 | 12 |
| Trenton, N.J. | 34 | 20 | 7 | 5 | - | - | 2 | Shreveport, La. | 46 | 28 | 13 | 3 | 1 | 1 | 6 |
| Utica, N.Y. | 29 | 22 | 6 | 1 | - | - | 1 | Tulsa, Okla. | 78 | 53 | 13 | 5 | 2 | 5 | 5 |
| Yonkers, N.Y. | 29 | 25 | 3 | 1 | - | - | 1 | MOUNTAIN | 666 | 417 | 139 | 67 | 18 | 25 | 42 |
| E.N. CENTRAL | 2,336 | 1,546 | 511 | 165 | 41 | 73 | 113 | Albuquerque, N.Mex. | 94 | 53 | 16 | 19 | 1 | 5 | 6 |
| Akron, Ohio | 57 | 37 | 12 | 5 | 1 | 2 | 5 | Colo. Springs, Colo. | 47 | 21 | 17 | 2 | 3 | 4 | 8 |
| Canton, Ohio | 36 | 28 | 4 | 3 | - | 1 | 2 | Denver, Colo. | 124 | 85 | 22 | 12 | 2 | 3 | 4 |
| Chicago, Ill. ^s | 564 | 362 | 125 | 45 | 10 | 22 | 16 | Las Vegas, Nev. | 17 | 78 | 30 | 7 | 1 | 1 | 10 |
| Cincinnati, Ohio | 158 | 105 | 37 | 8 | 4 | - | 4 | Ogden, Utah | 14 | 8 | 3 | 1 | 1 | 1 | 3 |
| Cleveland, Ohio | 148 | 96 | 38 | 12 | 2 | 2 | 2 | Phoenix, Ariz. | 116 | 72 | 24 | 14 | 5 | 1 | 9 |
| Columbus, Ohio | 163 | 103 | 38 | 12 | 4 | 6 | 3 | Pueblo, Colo. | 15 | 9 | 6 | - | - | - | 1 |
| Dayton, Ohio | 116 | 82 | 22 | 5 | 4 | 3 | 3 | Salt Lake City, Utah | 42 | 21 | 7 | 6 | 4 | 4 | - |
| Detroit, Mich. | 254 | 136 | 64 | 31 | 9 | 14 | 5 | Tucson, Ariz. | 97 | 70 | 14 | 6 | 1 | 6 | 1 |
| Evansville, Ind. | 61 | 41 | 17 | 3 | - | - | 4 | PACIFIC | 2,000 | 1,316 | 392 | 189 | 61 | 39 | 120 |
| Fort Wayne, Ind. | 50 | 28 | 16 | 4 | 2 | - | 2 | Berkeley, Calif. | 25 | 19 | 3 | 2 | - | 1 | 1 |
| Gary, Ind. | 14 | 9 | 1 | 4 | - | - | 1 | Fresno, Calif. | 69 | 43 | 12 | 2 | 6 | 5 | 6 |
| Grand Rapids, Mich. | 59 | 38 | 11 | 8 | - | 2 | 5 | Glendale, Calif. | 25 | 22 | 2 | 1 | - | - | 2 |
| Indianapolis, Ind. | 133 | 96 | 28 | 4 | 2 | 3 | 3 | Honolulu, Hawaii | 73 | 47 | 16 | 4 | 4 | 2 | 10 |
| Madison, Wis. | 32 | 20 | 9 | 2 | - | 1 | 4 | Long Beach, Calif. | 66 | 45 | 15 | 5 | 1 | - | 6 |
| Milwaukee, Wis. | 145 | 105 | 27 | 7 | 2 | 4 | 8 | Los Angeles, Calif. | 596 | 387 | 117 | 66 | 19 | 5 | 33 |
| Peoria, Ill. | 62 | 45 | 11 | 3 | - | 3 | 11 | Oakland, Calif. | 64 | 32 | 17 | 8 | 4 | 3 | 6 |
| Rockford, Ill. | 43 | 28 | 13 | 1 | - | 1 | 2 | Pasadena, Calif. | 33 | 28 | 5 | - | 1 | 1 | 3 |
| South Bend, Ind. | 47 | 34 | 13 | - | - | - | 1 | Portland, Oreg. | 116 | 78 | 22 | 7 | 5 | 4 | 5 |
| Toledo, Ohio | 130 | 100 | 19 | 6 | 1 | 4 | 14 | Sacramento, Calif. | 136 | 93 | 25 | 15 | 2 | 1 | 14 |
| Youngstown, Ohio | 64 | 53 | 8 | 2 | - | 1 | 1 | San Diego, Calif. | 169 | 111 | 28 | 17 | 7 | 5 | 12 |
| W.N. CENTRAL | 771 | 527 | 154 | 56 | 16 | 18 | 51 | San Francisco, Calif. | 198 | 108 | 50 | 34 | 3 | 3 | 3 |
| Des Moines, Iowa | 63 | 48 | 9 | 3 | 3 | - | 2 | San Jose, Calif. | 188 | 133 | 31 | 16 | 3 | 4 | 8 |
| Duluth, Minn. | 34 | 27 | 5 | 2 | - | - | 4 | Seattle, Wash. | 148 | 97 | 33 | 11 | 5 | 2 | 2 |
| Kansas City, Kans. | 37 | 24 | 8 | 3 | 2 | - | 2 | Spokane, Wash. | 56 | 45 | 9 | 1 | 1 | - | 8 |
| Kansas City, Mo. | 127 | 84 | 33 | 7 | 1 | 2 | 11 | Tacoma, Wash. | 39 | 30 | 7 | - | 2 | 4 | - |
| Lincoln, Nebr. | 21 | 17 | 3 | - | - | 1 | 1 | Wichita, Wash. | | | | | | | |
| Minneapolis, Minn. | 133 | 84 | 25 | 7 | 2 | 5 | 12 | TOTAL | 12,790 ^t | 8,321 | 2,613 | 1,153 | 336 | 363 | 726 |
| Omaha, Nebr. | 99 | 69 | 17 | 7 | 3 | 3 | 7 | | | | | | | | |
| St. Louis, Mo. | 134 | 74 | 36 | 16 | 2 | 4 | 6 | | | | | | | | |
| St. Paul, Minn. | 55 | 44 | 4 | 6 | - | 1 | 4 | | | | | | | | |
| Wichita, Kans. | 68 | 46 | 12 | 5 | 3 | 2 | 2 | | | | | | | | |

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

^tPneumonia and influenza.

^sBecause of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

^{††}Total includes unknown ages.

^{§§}Data not available. Figures are estimates based on average of past available 4 weeks.

Human Ehrlichiosis — Continued

by disseminated candidiasis, but he was discharged after 12 weeks of hospitalization without residual problems. Serum samples obtained during the late acute and convalescent periods of illness were negative for antibodies against *Rickettsia rickettsii* and other agents, but there was a 16-fold decrease in antibody titers against *E. canis* (highest titer, 640) by indirect fluorescent antibody (IFA) test. In addition, examination of inclusions in leukocytes by electron microscopy revealed a structure that was compatible with rickettsia belonging to the genus *Ehrlichia*.

Since this initial case report, 45 additional cases of human ehrlichiosis have been identified by various investigators (2-5; CDC, unpublished data). All but eight of these cases were detected by testing serum samples from patients who had suspected RMSF but who were seronegative for *R. rickettsii*.

Seventy-four percent of patients were male, and the majority of patients were between 30 and 60 years of age (range = 2-68). Patients were exposed to infection in 11 states,* the majority of which are in the southeastern and south central areas of the country. These are the same areas from which the majority of serum specimens tested for *E. canis* were obtained. Onsets of illness occurred between March and October.

Eighty-three percent of patients had a history of tick exposure in the 4-week period before onset of illness; the majority were exposed to ticks 1 to 3 weeks before they became ill. Information on the species of ticks involved was not available.

Symptoms reported by patients were nonspecific (Table 1) and similar to those reported by patients with RMSF. However, approximately 20% of patients with ehrlichiosis reported a rash (frequently nonspecific), whereas 88% of those with RMSF reported a rash (6). One patient was asymptomatic. Over half of the patients had hematologic abnormalities such as leukopenia and thrombocytopenia (Table 1) and mildly abnormal liver function tests, especially aspartate aminotransferase and alanine aminotransferase (Table 1). Although 63% of patients were hospitalized, all recovered without residual problems. However, there has been a preliminary report of a human fatality possibly associated with *E. canis* infection.

Reported by: Viral and Rickettsial Zoonoses Br, Div of Viral Diseases, Center for Infectious Diseases, CDC.

*Alabama, Arkansas, Georgia, Missouri, New Jersey, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia. The state of residence was used for two persons with no history of tick exposure.

TABLE 1. Clinical and laboratory findings for 46 human ehrlichiosis cases* — United States, 1986—May 1988

| Signs and Symptoms | Percentage of Cases | Laboratory Findings | Percentage of Cases |
|--------------------|---------------------|-------------------------------------|---------------------|
| Fever | 96 | Hematological Findings | |
| Headache | 80 | Leukopenia | 61 |
| Anorexia | 79 | Thrombocytopenia | 52 |
| Myalgia | 74 | Liver Function Tests | |
| Chills/Rigors | 70 | Elevated Aspartate Aminotransferase | 76 |
| Nausea/Vomiting | 69 | Elevated Alanine Aminotransferase | 75 |
| Weight Loss | 60 | Elevated Alkaline Phosphatase | 50 |
| Rash | 20 | Elevated Bilirubin (Total) | 29 |

*All types of findings were not reported for all 46 patients.

Human Ehrlichiosis — Continued

Editorial Note: *Ehrlichia*, members of the family *Rickettsiaceae*, are obligate, intracellular bacteria that parasitize mononuclear or polymorphonuclear leukocytes. The ability of *Ehrlichia* to infect and cause disease in animals is well documented (7). Canine ehrlichiosis, also known as tropical canine pancytopenia, is caused by *E. canis* and has an acute and chronic phase. After an incubation period of 10–14 days, dogs develop an acute febrile illness that may include depression, anorexia, lymphadenopathy, and thrombocytopenia (8). The chronic phase of the disease, which is often fatal, is characterized by pancytopenia and bone marrow hypoplasia. In the United States, serological evidence of *E. canis* infection has been reported among dogs in at least 34 states (9).

Preliminary data suggest that human ehrlichiosis, like canine ehrlichiosis, is tickborne. Although canine ehrlichiosis is transmitted by the brown dog tick, *Rhipicephalus sanguineus*, this tick is probably not the main vector or reservoir involved in human transmission since it rarely bites people (10). There is no evidence that human ehrlichiosis is transmitted directly from dogs to people (2,3).

Before 1986, only one *Ehrlichia* species, *E. sennetsu*, had been recognized as a human pathogen (11). Infection with *E. sennetsu* results in an acute febrile illness with lymphocytosis and postauricular and posterior cervical lymphadenopathy similar to mononucleosis. To date, this disease has been found only in Japan and Malaysia (7). Currently, the diagnosis of human ehrlichiosis is based on an IFA test that shows a fourfold or greater increase or decrease in antibody titer against *E. canis* with a minimum titer of 80. The test is a modification of the IFA test used for canine ehrlichiosis (12).

Tetracycline has been shown to be effective in both the acute and chronic phases of canine ehrlichiosis (13). Human ehrlichiosis appears to respond to tetracycline administered at the same dose and schedule used for RMSF. However, insufficient data exist to recommend chloramphenicol as an alternative antibiotic.

Physicians should consider the possibility of ehrlichiosis when patients have a febrile illness and a history of recent tick exposure. The diagnosis can be confirmed by testing acute- and convalescent-phase serum samples (taken 2–4 weeks apart) for *E. canis* antibody. Serologic testing for *E. canis* antibody is available at CDC. Only serum specimens submitted as pairs (i.e., acute- and convalescent-phase samples) will be accepted for testing. Specimens should be submitted to CDC through state health departments.

References

1. Maeda K, Markowitz N, Hawley RC, Ristic M, Cox D, McDade JE. Human infection with *Ehrlichia canis*, a leukocytic rickettsia. *N Engl J Med* 1987;316:853-6.
2. Fishbein DB, Sawyer LA, Holland CJ, et al. Unexplained febrile illnesses after exposure to ticks: infection with an *Ehrlichia*? *JAMA* 1987;257:3100-4.
3. Fishbein DB, Taylor JP, Dawson J, et al. Human ehrlichiosis in the United States [Abstract no. 1277]. In: Program and abstracts of the Twenty-Seventh Interscience Conference on Antimicrobial Agents and Chemotherapy. Washington, DC: American Society for Microbiology, 1987:319.
4. Rohrbach BW, Harkess JR, Ewing SA, Kudlac JF, McKee GL, Istre GR. Human ehrlichiosis, Oklahoma [Abstract no. 1278]. In: Program and abstracts of the Twenty-Seventh Interscience Conference on Antimicrobial Agents and Chemotherapy. Washington, DC: American Society for Microbiology, 1987:319.
5. Taylor JP, Betz TG, Fishbein DB, Roberts MA, Dawson J, Ristic M. Serologic evidence of possible human infection with *Ehrlichia* in Texas. *J Infect Dis* (in press).

Human Ehrlichiosis — Continued

6. Helmick CG, Bernard KW, D'Angelo LJ. Rocky Mountain spotted fever: clinical, laboratory, and epidemiological features of 262 cases. *J Infect Dis* 1984;150:480-8.
7. Ristic M. Pertinent characteristics of leukocytic rickettsiae of humans and animals. In: Leive L, ed. *Microbiology*—1986. Washington, DC: American Society for Microbiology, 1986: 182-7.
8. Kuehn NF, Gaunt SD. Clinical and hematologic findings in canine ehrlichiosis. *J Am Vet Med Assoc* 1985;186:355-8.
9. Keefe TJ, Holland CJ, Salyer PE, Ristic M. Distribution of *Ehrlichia canis* among military working dogs in the world and selected civilian dogs in the United States. *J Am Vet Med Assoc* 1982;181:236-8.
10. Nelson VA. Human parasitism by the brown dog tick. *J Econ Entomol* 1969;62:710-2.
11. Tachibana N. Sennetsu fever: the disease, diagnosis, and treatment. In: Leive L, ed. *Microbiology*—1986. Washington, DC: American Society for Microbiology, 1986:205-8.
12. Ristic M, Huxsoll DL, Weisiger RM, et al. Serological diagnosis of tropical canine pancytopenia by indirect immunofluorescence. *Infect Immun* 1972;6:226-31.
13. Amyx HL, Huxsoll DL, Zeiler DC, Hildebrandt PK. Therapeutic and prophylactic value of tetracycline in dogs infected with the agent of tropical canine pancytopenia. *J Am Vet Med Assoc* 1971;159:1428-32.

Current Trends**Recommendations for the Prevention of Malaria in Travelers**

Malaria continues to be an important health risk to Americans who travel to malaria-endemic areas of the world. The continued extension of chloroquine-resistant *Plasmodium falciparum* (CRPF) in Africa, Asia, South America, and Oceania has reduced the number of effective drugs for malaria prophylaxis. In addition, some alternative drugs to chloroquine have been found to be associated with serious adverse reactions, and thus their usefulness is limited. Guidelines for prophylaxis must take into account the risk of exposure to malaria, the effectiveness and safety of antimalarial drugs, and the use of personal protective measures. Recommendations for the prevention of malaria should be revised periodically because of geographic changes in the occurrence of drug-resistant *P. falciparum* malaria, new information on the efficacy or toxicity of drugs used for prophylaxis, and/or the availability of new drugs.

Malaria in humans is caused by one of four protozoan species of the genus *Plasmodium*: *P. falciparum*, *P. vivax*, *P. ovale*, and *P. malariae*. All are transmitted by the bite of an infected female *Anopheles* mosquito. Occasionally malaria is transmitted by blood transfusion or congenitally from mother to fetus. The disease is characterized by fever and influenza-like symptoms, which may occur at intervals and which include chills, headache, myalgia, and malaise. Malaria may be associated with anemia and jaundice, and *P. falciparum* infections may cause kidney failure, coma, and death. Deaths due to malaria are preventable.

Malaria - Continued**Risk of Acquiring Malaria**

Malaria transmission occurs in large areas of Central and South America, sub-Saharan Africa, the Indian Subcontinent, Southeast Asia,* the Middle East, and Oceania. The estimated risk of acquiring malaria varies markedly from area to area. This variability is a function of the intensity of transmission in both urban and rural areas within the various regions as well as a function of the itineraries of most travelers. For example, during the period 1983-1986, 634 cases of *P. falciparum* among American civilians were reported to CDC. Of these, 507 (80%) were acquired in sub-Saharan Africa; 44 (7%), in Southeast Asia; and 63 (10%), in the Caribbean and South America. Of the 28 fatal infections, 21 were acquired in sub-Saharan Africa. Thus, most cases of imported malaria among American travelers were acquired in sub-Saharan Africa, despite the fact that only an estimated 90,000 Americans travel to sub-Saharan Africa each year, whereas an estimated 900,000 Americans visit Southeast Asia and South America each year. This disparity in the risk of acquiring malaria stems from the fact that travelers to Africa are at risk in most rural and many urban areas. Moreover, travelers tend to spend considerable amounts of time, including evening and nighttime hours, in rural areas where malaria risk is highest. In contrast, most travelers to Southeast Asia and South America spend most of their time in urban or resort areas where risk of exposure, if any, is limited, and they travel to rural areas only during daytime hours, when risk is limited.

Drug Resistance

Resistance of *P. falciparum* to chloroquine has been reported from all countries with *P. falciparum* malaria except the Dominican Republic, Haiti, Central America, the Middle East, and the following countries in West Africa: Chad, Equatorial Guinea, Guinea, Guinea-Bissau, Liberia, Senegal, and Sierra Leone. In addition, resistance to both chloroquine and pyrimethamine/sulfadoxine (Fansidar®) is widespread in Thailand, Burma, and Kampuchea.

General Advice for Travelers to Malaria-Endemic Areas

All travelers to malaria-endemic areas are advised to use an appropriate drug regimen and personal protection measures to prevent malaria. However, travelers must be informed that, regardless of methods employed, malaria can still be contracted. Symptoms can develop as early as 8 days after initial exposure in a malaria-endemic area and as late as several months after departure from a malarious area. Travelers should understand that malaria can be treated effectively early in the course of the disease but that delaying appropriate therapy can have serious or even fatal consequences. Individuals who have the symptoms of malaria should seek prompt medical evaluation, including thick and thin malaria smears, as soon as possible.

Personal Protection Measures

Because of the nocturnal feeding habits of *Anopheles* mosquitoes, malaria transmission occurs primarily between dusk and dawn. Travelers must be advised of the importance of measures to reduce contact with mosquitoes during those hours. Such measures include remaining in well-screened areas, using mosquito nets, and wearing clothes that cover most of the body. Additionally, travelers should be advised to purchase insect repellent for use on exposed skin before travel. The most effective

*Thailand, Indonesia, Malaysia, People's Republic of China, the Philippines, Burma, Kampuchea, Vietnam, and Laos.

Malaria — Continued

repellents contain N,N diethylmetatoluamide (DEET), an ingredient in many commercially available insect repellents. The actual concentration of DEET varies among repellents (ranging up to 95%); the higher the concentration, the longer-lasting the repellent effect. Travelers should also be advised to purchase a pyrethrum-containing flying-insect spray to use in living and sleeping areas during evening and nighttime hours.

Chemoprophylaxis

Malaria chemoprophylaxis is the use of drugs to prevent the development of the disease. Preferably, malaria chemoprophylaxis should begin 1–2 weeks prior to travel to malarious areas. In addition to assuring adequate blood levels of the drug, this regimen allows any potential side effects to be evaluated and treated by the traveler's own physician. The exception is doxycycline; because of its short half-life, its use should begin 1–2 days before entering a malarious area. Chemoprophylaxis should continue during travel in malarious areas and for 4 weeks after departure from these areas.

In choosing an appropriate chemoprophylactic regimen prior to travel, several factors should be considered. The travel itinerary should be reviewed in detail and compared with the information on areas of risk within a given country to determine whether the traveler will actually be at risk of acquiring malaria. The risk of acquiring CRPF malaria is another consideration. In addition, any previous allergic or other reaction to the antimalarial drug of choice and the accessibility of medical care during travel must be determined.

Chemoprophylactic Regimens

For travel to areas of risk where CRPF has not been reported or where only low-level or focal chloroquine resistance has been reported, once-weekly use of chloroquine *alone* is recommended. Chloroquine is usually well tolerated. The few individuals who experience uncorrectable side effects may tolerate the drug better by taking it with meals or in divided, twice-weekly doses. As an alternative, the related compound hydroxychloroquine may be better tolerated. (See Table 1 for recommended dosages for chloroquine and other chemoprophylactic regimens.)

For travel to areas of risk where CRPF is endemic, once-weekly use of chloroquine *alone* is recommended. In addition, travelers to these areas (except those with histories of sulfonamide intolerance) should be given a treatment dose of Fansidar® to be carried during travel and should be advised to take the Fansidar® promptly in the event of a febrile illness during their travel *when professional medical care is not readily available*. It must be emphasized to these travelers that such presumptive self-treatment of a possible malarial infection is *only a temporary measure and that prompt medical evaluation is imperative*. They should be advised to continue their weekly chloroquine prophylaxis after presumptive treatment with Fansidar®. (See Table 1 for recommended dosage.)

Alternative Chemoprophylactic Regimens

Doxycycline *alone*, taken daily, is an alternative regimen for short-term travel to areas with risk of CRPF. It is particularly appropriate for those individuals with a history of sulfonamide intolerance or for those, such as short-term travelers to forested areas of Thailand, Burma, and Kampuchea, who may be at risk in areas of chloroquine and Fansidar® resistance. Travelers who use doxycycline should be cautioned about the possible side effects (see Adverse Reactions, page 282). Doxycycline prophylaxis can begin 1–2 days prior to travel to malarious areas. It should be continued daily during travel in malarious areas and for 4 weeks after departure from these areas.

TABLE 1. Drugs used in the prophylaxis and presumptive treatment

| Drug | Prophylaxis | |
|---|--|--|
| | Adult Dose | Pediatric Dose |
| Chloroquine phosphate (Aralen**) | 300 mg base (500 mg salt) orally, once/week | 5 mg/kg base (8.3 mg/kg salt) orally, once/week, up to maximum adult dose of 300 mg base |
| Hydroxy-chloroquine sulfate (Plaquenil**) | 310 mg base (400 mg salt) orally, once/week | 5 mg/kg base (6.5 mg/kg salt) orally, once/week, up to maximum adult dose of 310 mg base |
| Doxycycline | 100 mg orally, once/day | >8 years of age: 2 mg/kg of body weight orally, once/day up to adult dose of 100 mg/day |
| Proguanil (Paludrine**) | 200 mg orally, once/day, in combination with weekly chloroquine | <2 yrs: 50 mg/day 2-6 yrs: 100 mg/day 7-10 yrs: 150 mg/day >10 yrs: 200 mg/day |
| Pyrimethamine-sulfadoxine (Fansidar**) | 1 tablet (25 mg pyrimethamine and 500 mg sulfadoxine) orally, once/week | 2-11 mos: ½ tab/wk 1-3 yrs: ¼ tab/wk 4-8 yrs: ½ tab/wk 9-14 yrs: ¾ tab/wk >14 yrs: 1 tab/wk |
| Primaquine | 15 mg base (26.3 mg salt) orally, once/day for 14 days, or 45 mg base (79 mg salt) orally, once/week for 8 weeks | 0.3 mg/kg base (0.5 mg/kg salt) orally, once/day for 14 days, or 0.9 mg/kg base (1.5 mg/kg salt) orally, once/week for 8 weeks |

*Use of trade names is for identification only and does not imply endorsement by the Public Health Service.

atment of malaria

**Presumptive Treatment for Travelers
to Areas of Chloroquine Resistance**

Chloroquine is not recommended for the presumptive treatment of malaria acquired in areas of known chloroquine resistance.

Hydroxychloroquine is not recommended for the presumptive treatment of malaria acquired in areas of known chloroquine resistance.

Tetracyclines are not recommended for the presumptive treatment of malaria.

Proguanil is not recommended for the presumptive treatment of malaria.

Adult Dose

3 tablets (75 mg pyrimethamine and 1,500 mg sulfadoxine), orally, as a single dose

Pediatric Dose

2-11 mos: $\frac{1}{4}$ tab
1-3 yrs: $\frac{1}{2}$ tab
4-8 yrs: 1 tab
9-14 yrs: 2 tabs
 >14 yrs: 3 tabs
as a single dose

Primaquine is only recommended for use after leaving an endemic area to prevent relapses of *Plasmodium vivax* and *P. ovale*.

280

Malaria – Continued

MMWR

May 6, 1988

S

8

I

Malaria — Continued

Fansidar® taken once weekly in combination with chloroquine may be considered in exceptional circumstances involving prolonged exposure in areas with intense transmission of CRPF and where medical care is not available. If weekly use of Fansidar® is prescribed, the traveler should be cautioned about the possible side effects as described in the section on adverse reactions.

Proguanil (Paludrine®) is, like pyrimethamine, a dihydrofolate reductase (DHFR) inhibitor. Resistance of *P. falciparum* to DHFR inhibitors is present in some endemic regions, but its distribution is not well delineated. Proguanil is not available commercially in the United States. Limited data suggest that it may be effective in Kenya, but not in Thailand and Papua New Guinea. No current data are available on the efficacy of proguanil in other areas of CRPF, especially West Africa. Travelers using proguanil should take a daily 200-mg dose (adult) in combination with a weekly regimen of chloroquine.

Mefloquine (Lariam®), a new antimalarial similar in structure to quinine, is highly effective against both chloroquine- and Fansidar®-resistant *P. falciparum* infections. Approval for use in the United States is pending; currently the drug is available in France and Switzerland. Mefloquine may be considered for use by travelers to areas where there is risk of CRPF infection and by travelers to areas where *P. falciparum* is resistant to both chloroquine and Fansidar®. Currently available information suggests the adult prophylactic dose is 250 mg weekly. Mefloquine prophylaxis should begin 1 week before entry into the malarious area and should continue weekly while the traveler is there. Adverse reactions are infrequent at prophylactic dosage but may become more common with the higher doses used in treatment. Minor side effects observed with prophylactic doses, such as gastrointestinal disturbance and dizziness, tend to be transient and self-limited. Because mefloquine has occasionally been associated with asymptomatic sinus bradycardia and a prolonged QT interval, it should not be used by those receiving beta-blockers, calcium channel antagonists, or other drugs that may prolong or alter cardiac conduction.

Primaquine: Prevention of Relapses of *P. vivax* and *P. ovale*

Unlike *P. falciparum* and *P. malariae*, *P. vivax* and *P. ovale* have forms that can persist in the liver and cause relapses for as long as 4 years after routine chemoprophylaxis is discontinued. Travelers to malarious areas should be alerted to this risk; if they develop malaria symptoms after they return home, they should report their travel history and the possibility of malaria to a physician as soon as possible. Primaquine prevents relapses by acting against the liver stages of *P. vivax* and *P. ovale*; however, its use is not indicated for all travelers. Primaquine is administered after the traveler leaves an endemic area and usually in conjunction with chloroquine during the last 2 weeks of the 4-week period of prophylaxis after exposure in an endemic area has ended.

Since most malarious areas of the world (except Haiti) have at least one species of relapsing malaria, travelers to these areas have some risk of acquiring either *P. vivax* or *P. ovale*. However, this risk is extremely difficult to quantify. Prophylaxis with primaquine is generally indicated for persons who have had prolonged exposure in malaria-endemic areas, e.g., missionaries and Peace Corps volunteers. While the actual risk to the traveler with less intense exposure is difficult to define, with the exception of individuals deficient in glucose-6-phosphate dehydrogenase (G6PD) (see Adverse Reactions, page 282), most individuals can tolerate the standard regimen of primaquine.

Malaria - Continued**Adverse Reactions and Contraindications to Antimalarials**

The frequent or serious side effects of recommended antimalarials are discussed below. However, physicians should review the prescribing information in standard pharmaceutical reference texts and in the manufacturers' package inserts.

Chloroquine and hydroxychloroquine rarely have serious adverse reactions when taken at prophylactic doses for malaria. Occasionally, minor side effects such as gastrointestinal disturbance, headache, dizziness, blurred vision, and pruritus occur, but generally these do not require discontinuing the drug. While high doses of chloroquine, such as those used to treat rheumatoid arthritis, have been associated with retinopathy, this serious side effect has not been associated with routine weekly malaria prophylaxis. However, periodic ophthalmologic examinations for persons using chloroquine for extended periods (more than 6 years of cumulative weekly prophylaxis) are recommended. Chloroquine and related compounds may exacerbate psoriasis and may interfere with the antibody response to human diploid cell rabies vaccine.

Amodiaquine, a 4-aminoquinoline similar to chloroquine in structure and activity, has been used as an alternative prophylactic drug in areas where CRPF is endemic. It is not commercially available in the United States. Amodiaquine-associated agranulocytosis has been reported among travelers from the United Kingdom and Switzerland, countries where the drug has been commercially available. Therefore, amodiaquine is *not* recommended for malaria prophylaxis (1).

Fansidar® can cause severe adverse cutaneous reactions. Between 1982 and 1985, 24 cases of erythema multiforme, Stevens-Johnson syndrome, and toxic epidermal necrolysis were documented among American travelers using Fansidar®. Seven of these reactions were fatal. Available data indicate that the incidence of fatal cutaneous reactions associated with the use of Fansidar® among American travelers ranges from 1/11,000 to 1/25,000 users. These severe cutaneous reactions were associated with Fansidar® when used as once-weekly prophylaxis. Fansidar® has also been associated with serum-sickness-type reactions, urticaria, exfoliative dermatitis, and hepatitis. IF ONCE-WEEKLY USE OF FANSIDAR® IS PRESCRIBED, THE TRAVELER SHOULD BE ADVISED TO DISCONTINUE IT IMMEDIATELY IF HE/SHE DEVELOPS A POSSIBLE ILL EFFECT, ESPECIALLY ANY SKIN OR MUCOUS MEMBRANE SIGNS OR SYMPTOMS, SUCH AS ITCHING, REDNESS, RASH, MOUTH OR GENITAL LESIONS, OR SORE THROAT. Use of Fansidar® is contraindicated for persons with histories of sulfonamide intolerance and for infants under 2 months of age.

Doxycycline is a tetracycline and may cause side effects associated with this group of drugs. Travelers to tropical climates who use doxycycline should be made aware of the possibility of photosensitivity, usually manifested as an exaggerated sunburn reaction. The risk of such a reaction can be minimized by avoiding prolonged, direct exposure to the sun. In addition, doxycycline use may be associated with an increased frequency of monilial vaginitis. Doxycycline is contraindicated in pregnancy (see Prophylaxis During Pregnancy, this page) and for children under 8 years of age.

Primaquine may cause severe hemolysis in G6PD-deficient individuals. Before using primaquine, G6PD deficiency should be ruled out by appropriate laboratory testing.

Prophylaxis During Pregnancy

Malaria infection in pregnant women may be more severe than in nonpregnant women. In addition, the risk of adverse pregnancy outcomes, including prematurity,

Malaria — Continued

abortion, and stillbirth, may be increased. For these reasons, and because chloroquine has not been found to have any harmful effects on the fetus when used in the recommended doses for malaria prophylaxis, pregnancy is not a contraindication to malaria prophylaxis with chloroquine or hydroxychloroquine. However, because no chemoprophylactic regimen is completely effective in areas with CRPF, women who are pregnant or likely to become so should avoid travel to such areas.

The safety of Fansidar® during pregnancy has not been completely established. Experimental data demonstrating the teratogenic effect of pyrimethamine in laboratory animals has resulted in restrictions in the licensing of compounds containing pyrimethamine. However, pyrimethamine, alone and in combination with sulfonamides, has been used for nearly 30 years to treat pregnant women with toxoplasmosis (another protozoal parasitic infection). While caution must be exercised when extrapolating from accumulated case reports of women treated for this infection, it is difficult to implicate pyrimethamine as a cause of fetal abnormalities. Thus, while the teratogenic effect in animals cannot be ignored, published data do not substantiate the inference that pyrimethamine is a human teratogen.

Sulfadoxine is a sulfonamide antimicrobial that, when administered during the last trimester of pregnancy, theoretically could compete with bilirubin for plasma proteins and exacerbate neonatal jaundice. It is unclear, however, whether this specific sulfa congener poses any risk to the newborn.

Doxycycline, a tetracycline, is generally contraindicated for malaria prophylaxis during pregnancy. Adverse effects of tetracyclines on the fetus include discoloration and severe dysplasia of the teeth and inhibition of bone growth. In pregnancy, therefore, tetracyclines would be indicated only if required to treat life-threatening infections due to multidrug-resistant *P. falciparum*.

Primaquine should not be used during pregnancy because the drug may be passed transplacentally to a G6PD-deficient fetus and cause life-threatening hemolytic anemia in utero. Whenever radical cure or terminal prophylaxis with primaquine is indicated, chloroquine should be given once a week until delivery, at which time the decision to give primaquine may be made.

Prophylaxis While Breastfeeding

Very small amounts of antimalarial drugs are secreted in the breast milk of lactating women. The amount of drug transferred is not thought to be harmful to the nursing infant; however, more information is needed. Because the quantity of antimalarials transferred in breast milk is insufficient to provide adequate protection against malaria, infants who require chemoprophylaxis should receive the recommended dosages of antimalarials (Table 1).

Chemoprophylaxis for Children

Children of any age can contract malaria. Consequently, the indications for prophylaxis are identical to those described for adults. Doxycycline is contraindicated for children less than 8 years of age, and Fansidar® is contraindicated for infants less than 2 months of age.

Chloroquine phosphate, which is manufactured in the United States in tablet form only, tastes quite bitter. Pediatric doses should be calculated carefully according to body weight. Pharmacists can pulverize tablets and prepare gelatin capsules with calculated pediatric doses. Mixing the powder in food or drink may facilitate the weekly administration of chloroquine to children. Alternatively, chloroquine in suspension is widely available overseas.

Malaria - Continued

OVERDOSE OF ANTIMALARIAL DRUGS CAN BE FATAL. THE MEDICATION SHOULD BE STORED IN CHILDPROOF CONTAINERS OUT OF THE REACH OF CHILDREN.

Health Information for International Travel 1988 will soon be published by the Center for Prevention Services, CDC. This document includes the above recommendations for the prevention and presumptive treatment of malaria in travelers. In addition, it includes the chemoprophylactic regimen recommended for each country and the risk of malaria in each country. It will be a useful reference to health professionals, travel agencies, international businesses, and other agencies that advise international travelers concerning malaria and other health risks they may encounter when visiting foreign countries. This publication will be available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, telephone (202)783-3238, as DHHS publication no. (CDC)88-8280.

Reported by: Malaria Br, Div of Parasitic Diseases, Center for Infectious Diseases; Div of Quarantine, Center for Prevention Svcs, CDC.

Reference

1. Centers for Disease Control. Agranulocytosis associated with the use of amodiaquine for malaria prophylaxis. MMWR 1988;35:165-6.

★U.S. Government Printing Office: 1988-530-111/81500 Region IV

**DEPARTMENT OF
HEALTH & HUMAN SERVICES**
Public Health Service
Centers for Disease Control
Atlanta, GA 30333

FIRST-CLASS MAIL
POSTAGE & FEES PAID
PHS/CDC
Permit No. G-284

Official Business
Penalty for Private Use \$300

A 40-~~100~~ 06 8639 9 X
SERIALS ACQUISITION DEPT
UNIVERSITY MICROFILMS
300 NORTH ZEEB ROAD
ANN ARBOR, MI 48106

